

REMARKS

Applicant hereby affirms the provisional election of claims 1 – 21. No claims have been cancelled or added. Claims 22 – 26 are withdrawn from further consideration. Hence, claims 1 – 26 are pending in the Application.

Claims 4 – 5, 11 – 12, and 17 – 19 have been found to cover allowable subject matter, but have been objected to because they depend on base claims that have been rejected as unpatentable. However, as shown below, these rejected base claims are patentable and the rejection of them is therefore invalid. The removal of the objections to claims 4 – 5, 11 – 12, and 17 – 19 is therefore respectfully requested.

Claims 1 – 3, and 6 – 10, 13 – 16, and 20 – 21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,692,174, herein *Bireley*. These rejections are traversed.

CITED ART

Because the rejections are based on *Bireley*, a description of *Bireley* is useful. *Bireley* teaches a system for parallel execution of queries. In *Bireley*, a query may be divided into subtasks, which are executed in parallel by DBMS in a shared data DBMS system. *Bireley* includes a section, provided below, that provides a comprehensive review of its teachings. This section includes those cited by the Examiner as disclosing the limitations of claims 1, 8, and 15.

The present invention provides an inbound and outbound control for determining how to allocate the parallel tasks of a decomposed query. These controls are used to regulate the workload balanced on the DBMSs of the system. The outbound control dictates whether an originating DBMS is enabled to execute multi-CPC query parallelism and assign parallel tasks to assisting DBMSs. When disabled, the outbound control forces an originating DBMS to process the query locally on a single CPC. In contrast, an assisting DBMS uses an inbound control to limit the amount of support allocated to other coordinating DBMSs. The inbound control provides an assisting DBMS with a mechanism for setting a threshold of how much query parallelism work will be accepted. When fully

disabled, the inbound control dedicates an assisting DBMS to perform only local work and ensures that performance is not impacted by outside requests.

In addition to the inbound and outbound controls, an optimizer in the originating DBMS performs a cost-based analysis in determining how to decompose a query. If a query requires access to a partitioned table space, a table located in separate storage devices, then it becomes a candidate for parallelism. The optimizer next determines the processor cost and input/output (I/O) cost for this query and calculates an optimum degree of parallelism while balancing these costs. The optimum degree is the number of parallel tasks into which the query is decomposed.

There are numerous advantages and features of multi-CPC query parallelism in a shared data DBMS system. First, query parallelism decomposes a long running query into multiple parallel tasks which are then executed across multiple-CPCs. This scheme greatly reduces the elapsed time of such a query than if the query was executed on a single-CPC. Second, query parallelism in a shared data DBMS environment is not adversely affected when a DBMS in the system becomes unavailable due to planned or unplanned circumstances. The query decomposition exploits the surviving DBMSs in the complex and allocates the parallel tasks accordingly. Third, the present invention minimizes system overhead and thrashing by limiting the amount of parallelism in the system via the optimal degree and refinement of the optimal degree at run-time. (column 6, lines 22 – 64)

CLAIMS 1, 8, AND 15

Claims 1 and 8 recite:

generating metadata that defines:

one or more tables spaces for said database system, and
an association between said one or more tablespaces and said plurality of users;
selecting which tablespaces to use to store data for each of user of said plurality of users
based on said association between said one or more tablespaces and said plurality
of users; and

exporting to another database system said data associated with a particular user, wherein the step of exporting includes generating a binary copy of a subset of one or more tablespaces of said one or more tablespaces, wherein said subset of one or more tablespaces were selected to store data for said particular user.

Claim 15 recites:

a database system that stores data for a plurality of users in one or more tablespaces; said database system including metadata that defines an association between said one or more tablespaces and said plurality of users; and
said database system configured to select which tablespaces to use to store data for each user of said plurality of users based on said association between said one or more tablespaces and said plurality of users; and
said database system configured to export to another database system said data associated with a particular user by performing steps that include generating a binary copy of a subset of one or more tablespaces of said one or more tablespaces, wherein said subset of one or more tablespaces were selected to store data for said particular user.

Claims 1, 8, and 15 contain numerous features not disclosed or suggested by the cited art. Applicant specifies below some of the features not disclosed or suggested by the cited art, and for each feature of these specified features, explains why the cited art fails to disclose or suggest the feature and/or why the particular sections cited by the Examiner as disclosing the feature do not in fact disclose or suggest the limitation.

As a preliminary matter, Applicant notes that *Bireley* uses the term tablespace, but does not explicitly provide a definition. For purposes of argument, Applicant is assuming the term tablespace has an equivalent meaning for both *Bireley* and the claims. As shown below, even if it is assumed that the meanings are equivalent, *Bireley* nevertheless fails to disclose or suggest any of the limitations.

A. *Bireley* fails to disclose the feature of generating metadata that defines an association between tablespaces and users.

Applicant has reviewed *Bireley* and has not found any disclosure or suggestion of defining an association between tablespaces and users, let alone generating metadata that defines such an association.

The Examiner cites the following section of *Bireley* as disclosing this feature (Office Action, section 6).

In addition to the inbound and outbound controls, an optimizer in the originating DBMS performs a cost-based analysis in determining how to decompose a query. If a query requires access to a partitioned table space, a table located in separate storage devices, then it becomes a candidate for parallelism. The optimizer next determines the processor cost and input/output (I/O) cost for this query and calculates an optimum degree of parallelism while balancing these costs. The optimum degree is the number of parallel tasks into which the query is decomposed. (col. 6, lines 39 – 48)

Obviously, this section does not describe or in any way suggest generating metadata or defining an association between tablespaces and users, let alone generating metadata that defines such an association. With respect to any teaching about tablespaces, at best the section may describe or suggest an association between storage devices and tablespaces, and how a tablespace being partitioned across multiple storage devices affects a DBMS's ability to execute a query in parallel. However, nothing in this section suggests defining an association between tablespaces and users, let alone generating metadata that defines such an association.

B. *Bireley* fails to disclose the feature of selecting which tablespaces to use to store data for users based on an association between one or more tablespaces and the users.

In Applicant's review of *Bireley*, Applicant has not find any teaching that discloses or suggests selecting which tablespaces to use to store data for users based on an association between tablespaces and users. Applicant admits that, under the assumption regarding the meaning of tablespaces mentioned above, *Bireley* teaches that data is stored tablespaces. However, *Bireley* does not disclose any particular technique for selecting a tablespace for the purpose of storing data, let alone one based on an association between tablespaces and users, as claimed.

C. *Bireley* fails to disclose the feature of generating a binary copy of tablespaces that were selected to store data for a particular user to export the data to another database system.

In Applicant's review of *Bireley*, Applicant has not found any teaching that discloses or suggests generating a binary copy of a set of tablespaces that were selected to store data for a particular user to export the data to another database system. *Bireley* teaches about parallel execution on a shared DBMS system, where each of the DBMSs share access to the multiple storage devices that hold a tablespace. (col. 5, lines 36 – 39) No teaching in *Bireley* suggests that a DBMS in the DBMS system makes a copy of a tablespace and exports it within the system to another DBMS, which would have shared access to the tablespace anyway. Nor is there any teaching in *Bireley* that a DBMS generates a copy of a tablespace to export the copy to a DBMS on another DBMS system.

The Examiner cites the following section of *Bireley* as disclosing this feature (Office Action, section 6).

In contrast, an assisting DBMS uses an inbound control to limit the amount of support allocated to other coordinating DBMSs. The inbound control provides an assisting DBMS with a mechanism for setting a threshold of how much query parallelism work will be accepted. When fully disabled, the inbound control dedicates an assisting DBMS to perform only local work and ensures that performance is not impacted by outside requests.

In addition to the inbound and outbound controls, an optimizer in the originating DBMS performs a cost-based analysis in determining how to decompose a query. If a query requires access to a partitioned table space, a table located in separate storage devices, then it becomes a candidate for parallelism. (col. 6, lines 30 – 44)

Clearly, the above section mentions nothing of creating binary copies a tablespaces, much less binary copies of tablespaces that were selected to store data for a particular user to export to another database system data associated with the particular user.

Perhaps the Examiner interpreted the inbound and outbound controls as mechanisms that perform the functions of copying and exporting copies of tablespaces and importing such copies. However, *Bireley*'s teaching about inbound and outbound controls do not in any way suggest that the inbound and outbound controls perform such functions. Rather, *Bireley* teaches that the inbound and outbound controls perform the function of regulating the workload balanced on the DBMS system as follows.

The present invention provides an inbound and outbound control for determining how to allocate the parallel tasks of a decomposed query. **These controls are used to regulate the workload balanced on the DBMSs of the system.** The outbound control dictates whether an originating DBMS is enabled to execute multi-CPC query parallelism and assign parallel tasks to assisting DBMSs. When disabled, the outbound control forces an originating DBMS to process the query locally on a single CPC. In contrast, an assisting DBMS uses an inbound control to limit the amount of support allocated to other

coordinating DBMSs. The inbound control provides an assisting DBMS with a mechanism for setting a threshold of how much query parallelism work will be accepted. When fully disabled, the inbound control dedicates an assisting DBMS to perform only local work and ensures that performance is not impacted by outside requests. (Col. 6, lines 22 – 38)

D. Conclusion

As shown above, *Bireley* fails to disclose or suggest at least some of the limitations of claims 1, 8, and 15. Therefore, claims 1, 8, and 15 are patentable. Reconsideration and allowance of claims 1, 8, and 15 is respectfully requested.

REMAINING REJECTED CLAIMS

The remaining rejected claims not discussed so far are defendant claims that depend on an independent claim that is discussed above. Because each of these defendant claims include the limitations of claims upon which they depend, these defendant claims are patentable for at least those reasons the claims upon which the defendant claims depend are patentable. Removal of the rejections with respect to these defendant claims and their allowance is respectfully requested. In addition, these dependent claims introduce additional limitations that independently render them patentable. Due to the fundamental difference already identified, a separate discussion of those limitations is not included at this time.

For the reasons set forth above, Applicant respectfully submits that all pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all claims is hereby respectfully solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Respectfully submitted,

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